WHAT IS CLAIMED IS:

1. An isolated nucleic acid comprising a member selected from the group consisting of:

(a) a polynucleotide that encodes a polypeptide of SEQ ID NO: 1;

(b) a polynucleotide amplified from a plant nucleic acid library using the primers of SEQ ID NOS: 3 and 4 or 5 and 6;

(c) a polynucleotide having 20 contiguous bases of SEQ ID NO: 1;

(d) a polynucleotide encoding a plant Cyclin E protein;

(e) a plant Cyclin E polynucleotide having at least 70% identity to the entire coding region of SEQ ID NO: 1, wherein the % identity is determined by GCG/bestfit GAP 10 program using a gap creation penalty of 50 and a gap extension penalty of 3;

(f) a plant Cyclin E polynucleotide that hybridizes under stringent conditions to a nucleic acid characterized by SEQ ID NO: 1, wherein the conditions include a wash in 0.1X SSC at 60 to 65°C;

(g) a polynucleotide having the sequences set forth in SEQ ID NO: 1; and

(h) a polynucleotide complementary to a polynucleotide of (a) through (g).

Sub A1 2. The isolated nucleic acid of claim 1, wherein the polynucleotide is from a monocot.

3. The isolated nucleic acid of claim 2, wherein the polynucleotide is from maize.

Sub A2 4. The isolated nucleic acid of claim 1, wherein the polynucleotide is from a dicot.

5. The isolated nucleic acid of claim 4, wherein the polynucleotide is from soybean.

6. The isolated nucleic acid of claim 1, wherein the polynucleotide has the sequence of SEQ ID NO: 1.

7. The isolated nucleic acid of claim 1, wherein the polynucleotide is DNA.

8. The isolated nucleic acid of claim 1, wherein the polynucleotide is RNA.

9. The isolated nucleic acid of claim 1 adducted to a second nucleic acid sequence encoding a DNA-binding domain.

10. A vector comprising at least one nucleic acid of claim 1.

11. A recombinant expression cassette comprising a nucleic acid of claim 1 operably linked to a promoter in sense or antisense orientation.

12. The recombinant expression cassette of claim 11, wherein the nucleic acid is operably linked in sense orientation to the promoter.

13. A host cell containing the recombinant expression cassette of claim 11.

14. The host cell of claim 13 that is a procaryote or a plant cell.

15. The host cell of claim 14 that is a corn, soybean, sorghum, sunflower, safflower, wheat, rice, alfalfa or oil-seed *Brassica* cell.

16. A transgenic plant comprising at least one expression cassette of claim 11.

17. The plant of claim 16 that is corn, soybean, sorghum, sunflower, safflower, wheat, rice, alfalfa or oil-seed *Brassica.*

18. A seed from the plant of claim 16.

19. A seed from the plant of claim 17.

20. An isolated protein comprising a member selected from the group consisting of:

(a) a polypeptide comprising at least 30 contiguous amino acids of SEQ ID NO: 2;

(b) a polypeptide that is a plant cyclin E protein;

(c) a polypeptide comprising at least 65% sequence identity to SEQ ID NO: 2, wherein the % sequence identity is based on the entire sequence and is determined by GCG/bestfit GAP 10 using a gap creation penalty of 50 and a gap extension penalty of 3;

(d) a polypeptide encoded by a nucleic acid of claim 1; and

(e) a polypeptide characterized by SEQ ID NO: 2.

21. The protein of claim 20, wherein the polypeptide is catalytically active.

22. A ribonucleic acid sequence encoding the protein of claim 20.

23. A method of modulating the level of CycE protein in a cell, comprising:

(a) transforming a cell with a recombinant expression cassette comprising a CycE polynucleotide operably linked to a promoter;

(b) growing the cell under cell-growing conditions for a time sufficient to induce expression of the polynucleotide sufficient to modulate CycE protein in the cell.

24. The method of claim 23, wherein CycE protein is increased.

25. The method of claim 23, wherein CycE protein is decreased.

26. The method of claim 23, wherein the level of CycE protein in the cell is transiently modulated by introducing CycE ribonucleic acid.

27. The method of claim 23, wherein the CycE protein is present in an amount sufficient to alter cell division.

28. The method of claim 23, wherein the CycE protein is present in an amount sufficient to increase the number of dividing cells.

29. The method of claim 23, wherein the CycE protein is present in an amount sufficient to improve transformation frequencies.

30. The method of claim 23, wherein the CycE protein is present in an amount sufficient to alter cell growth.

31. The method of claim 23, wherein the CycE protein is present in an amount sufficient to provide a positive growth advantage for the cell.

32. The method of claim 23, wherein the CycE protein is present in an amount sufficient to increase the growth rate.

33. The method of claim 23, wherein the cell is a plant cell and the plant cell is grown under conditions appropriate for regenerating a plant capable of expressing CycE protein.

34. The method of claim 33, wherein the plant cell is from corn, soybean, wheat, rice, alfalfa, sunflower, safflower, or canola.

35. The method of claim 33, wherein the CycE protein is present in an amount sufficient to increase crop yield.

36. The method of claim 33, wherein the CycE protein is present in an amount sufficient to alter plant height or size.

37. The method of claim 33, wherein the CycE protein is present in an amount sufficient to enhance or inhibit organ growth.

38. The method of claim 37, wherein the organ is a seed, root, shoot, ear, tassel, stalk, pollen, or stamen.

39. The method of claim 38, wherein the level of CycE protein is modulated to produce organ ablation.

40. The method of claim 38, wherein the level of CycE protein is modulated to produce parthenocarpic fruits.

41. The method of claim 38, wherein the level of CycE protein is modulated to produce male sterile plants.

42. The method of claim 33, wherein the CycE protein is present in an amount sufficient to enhance embryogenic response.

43. The method of claim 33, wherein the CycE protein is present in an amount sufficient to increase callus induction.

44. The method of claim 33, wherein the level of CycE protein is modulated to provide for positive selection.

45. The method of claim 33, wherein the level of CycE protein is modulated to increase plant regeneration.

46. The method of claim 23, wherein the level of CycE protein is modulated to alter the percent of time that the cells are arrested in G1 or G0 phase.

47. The method of claim 23, wherein the level of CycE protein is modulated to alter the amount of time the cell spends in a particular cell cycle.

48. The method of claim 23, wherein the level of CycE protein is modulated to improve the response of the cells to environmental stress including dehydration, heat, or cold.

49. The method of claim 33, wherein the level of CycE protein is modulated to increase the number of pods per plant.

50. The method of claim 33, wherein the level of CycE protein is modulated to increase the number of seeds per pod or ear.

51. The method of claim 33, wherein the level of CycE protein is modulated to alter the lag time in seed development.

52. The method of claim 33, wherein the level of CycE protein is modulated to provide hormone independent cell growth.

53. The method of claim 23, wherein the level of CycE protein is modulated to increase the growth rate of cells in bioreactors.

54. The method of claim 23, wherein the level of CycE protein in cells is transiently modulated by introducing CycE ribonucleic acid.

55. A method for transiently modulating the level of CycE protein in plant cells comprising introducing CycE polypeptides.

56. A method for identifying CycE interacting proteins comprising adducting the nucleic acid sequence of claim 1 to a second nucleic acid sequence encoding a DNA-binding domain.

57. A method for increasing transformation efficiency comprising introducing into a responsive plant cell at least one polypeptide capable of enhancing

the transition from G1 to S phase compared to a non-transformed plant cell or at least one polynucleotide encoding the polypeptide, and if the polynucleotide is DNA, the DNA is operably linked to a promoter.

58. The method of claim 57 wherein the at least one polypeptide is a CycD, CycE, E2F, RepA, cdk2, cdk4, Rb, or CK1 polypeptide.

59. The method of claim 58 wherein the level of CycD, CycE, E2F, RepA, cdk2, or cdk4 polypeptide is increased.

60. The method of claim 59, wherein the at least one polypeptide is a combination of CycE and CycD polypeptides.

61. The method of claim 58, wherein the level of Rb or CK1 polypeptide is reduced.

62. A method for transiently modifying the level of CycE protein in a recipient cell the method comprising:

(a) introducing a vector containing a polynucleotide encoding a delivery protein to produce a modified bacterium, wherein the delivery protein is functionally fused to the polynucleotide encoding CycE;

(b) co-cultivating the modified bacterium with a recipient cell to transiently modify the level of protein in the cell.

63. The method of claim 62 wherein the polynucleotide encoding the delivery protein is selected from the group consisting of VirD2, VirE2, or VirF.

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